

REMARKS

Claims 1 and 3 – 5 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

DRAWINGS

The Examiner has indicated that Figures 4 – 7 should be designated by a legend, such as – Prior Art –. Applicant has attached revised drawings for the Examiner's approval. In the "Replacement Sheets" revised Figures 4 – 7 include a – Prior Art – legend.

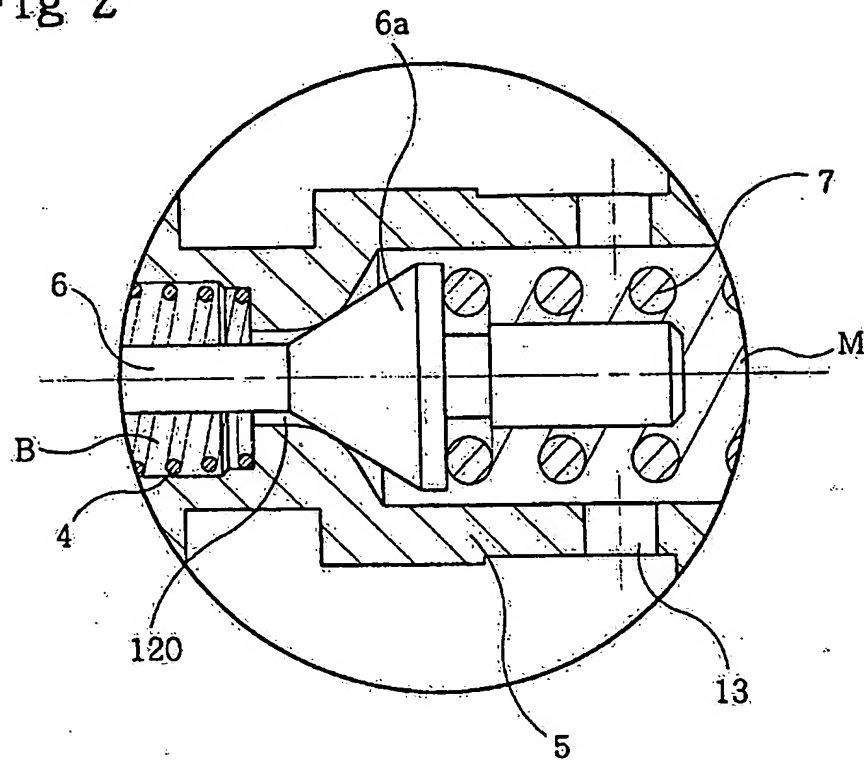
REJECTION UNDER 35 U.S.C. § 103

Claims 1 – 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over prior art admitted by the applicant in view of Friedell (U.S. Pat. No. 3,620,501). This rejection is respectfully traversed.

At the outset, Applicant notes that claim 1 has been amended to include a pilot poppet having an inner arcuately shaped surface having an inner diameter which is gradually increased in the downstream direction. The surface prevents an instant pressure decrease of the fluid which is discharged.

Figure 2 of Applicant's specification is recreated below to illustrate such an arcuately shaped surface as encompassed by the claim language.

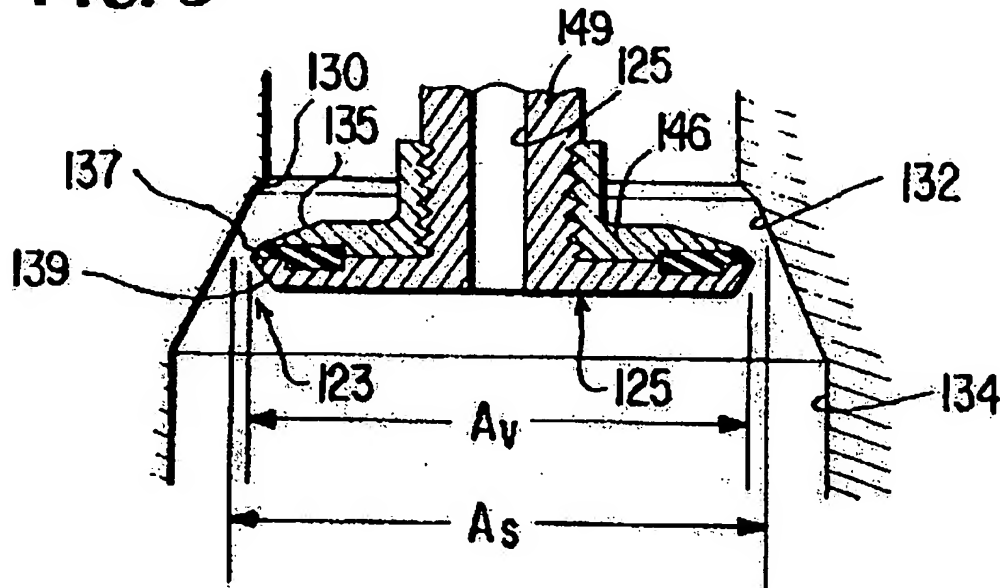
Fig 2



With regard to claim 1, Applicant respectfully notes that the prior art admitted to by the Applicant fails to teach or suggest an inner arcuately shaped surface having an inner diameter which is gradually increased in the downstream direction. Prior Art Figures 4 – 7 (from Applicant's specification) illustrate the deficiencies of conventional designs in resolving vibration and noise. Friedell fails to cure the deficient teachings of the admitted prior art. More specifically, Friedell discloses an inner surface that is comprised of several flat segments including surface part 130, conically shaped area

132 and cylindrically shaped area 134. The segments intersect at hard angle points or breaks indicated by the hard intersection lines in Figures 1, 3 and 4. Figure 3 of Friedell has been recreated below to illustrate the hard intersection of the flat segments.

FIG. 3



Accordingly, Friedell fails to teach or suggest an inner arcuately shaped surface having an inner diameter which is gradually increased in the downstream direction. Therefore, reconsideration and withdrawal of the rejection are respectfully requested.

Claim 2 has been cancelled herein without prejudice or disclaimer of the subject-matter contained therein. Therefore, the rejection of claim 2 has been rendered moot.

Claims 3 – 5 depend from claim 1, which defines over the prior art as discussed in detail above. Therefore, claims 3 – 5 also define over the prior art and reconsideration and withdrawal of the rejections are respectfully requested.

Although not applied by the Examiner, the other cited prior art also fails to disclose or suggest Applicant's claimed subject matter. For example, Araki et al. (U.S.

Pat. No. 4,269,227) includes a sharp edge 48 that results in a rapid pressure decrease in the passing fluid stream. This rapid pressure decrease generates the noise and vibration that the present invention resolves.

Similarly, Asaoka (U.S. Pat. No. 4,860,788), teaches an inner diameter of the valve seat 38 to include a sharp edge resulting in a non-linear shape (i.e., two linear surfaces intersecting at a corner). The non-linear shape results in the noise and vibration discussed above. Machat et al. (U.S. Pat. No. 5,295,663) teaches a linearly shaped valve seat 36 with an initial inclination 31. Thus, Machat et al. also fails to teach or suggest an inner arcuately shaped surface having an inner diameter which is gradually increased in the downstream direction.

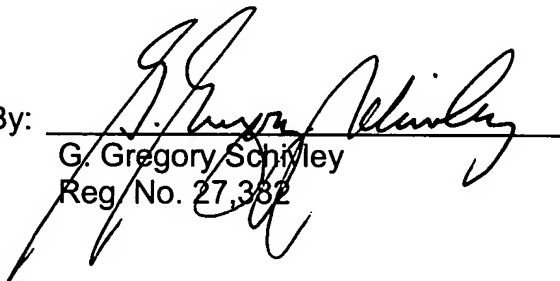
Körtge (U.S. Pat. No. 5,460,198) and Nguyen et al. (U.S. Pat. No. 6,263,909) vary from the claimed invention in composition and effect. More specifically, the valve of Körtge and Nguyen is designed to compensate for leakage of pressurized fluid between engageable surfaces of a piston and bore wall. The teaching of Körtge and Nguyen includes a flow control valve and a pressure limiting valve disposed in respective cavities of a housing. The main poppet and pilot poppet of the presently claimed invention are disposed in a common cavity. Grant (U.S. Pat. No. 5,533,548) relates to eliminating noise generated at an interface between the poppet 14 and the housing 12. The present invention, as claimed, eliminates noise generated between the pilot poppet 6 and the discharging port 120 of a seat 5.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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